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IMPERATIVE(U) ARMY RUSSIAN INST APO NEW YORK 09053  
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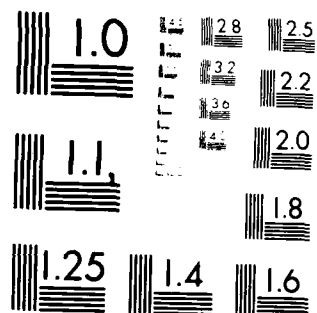
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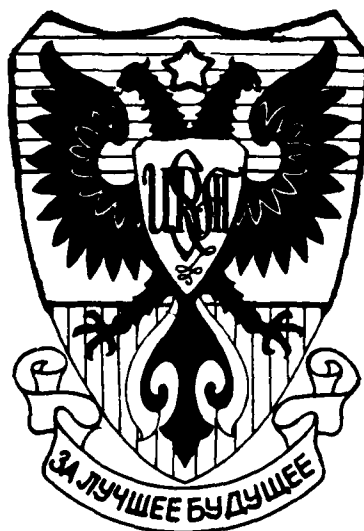


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## STUDENT RESEARCH REPORT

SOVIET MAINTENANCE TRAINING AND  
THE TECHNOLOGICAL IMPERATIVE  
MAJ Kolman A. Gabel

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The paper concludes that the Soviets have a workable and relatively effective system for peacetime maintenance training which overcomes the severe handicap of a two year conscript army serving without experienced NCO's and career enlisted men. How the system would work in wartime when line units had no time to train is questionable.

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MAJOR KOLMAN A. GABEL

June 1980

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**DEPARTMENT OF THE ARMY**  
**U. S. ARMY RUSSIAN INSTITUTE**  
**APO NEW YORK 09053**

F O R E W O R D

This research project represents fulfillment of a student requirement for successful completion of the overseas phase of training of the Department of the Army's Foreign Area Officer Program (Russian).

Only unclassified sources are used in producing the research paper. The opinions, value judgements and conclusions expressed are those of the author and in no way reflect official policy of the United States Government, Department of Defense, Department of the Army, the US Army Intelligence and Security Command, or the Russian Institute. The completed paper is not to be reproduced in whole or in part without permission of the Commander, US Army Russian Institute, APO New York 09053.

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A handwritten signature in black ink, reading "John G. Canyock", is positioned above the printed name and title.

JOHN G. CANYOCK  
LTC, MI  
Commanding

## SUMMARY

### SOVIET MAINTENANCE TRAINING AND THE TECHNOLOGICAL IMPERATIVE

This report is an overview of technical training methods currently used in the Soviet Ground Forces. Although the emphasis is on training for maintenance and repair, much of what is presented is applicable to all types of technical training. The report is based on recurring themes and explanations of techniques revealed through a review of open source Soviet military journals. The role of the Communist Party in the training process, socialist competition and obligations, the use of innovators, inventors and rationalizers, as well as the importance placed on technological awareness are discussed. Driver training, seasonal servicing, equipment transfer, storage procedures, motor pool days, and the importance of officer responsibilities are included. Training methodologies unique to the communist system are examined in light of the current military-technical environment.

The paper concludes that the Soviets have a workable and relatively effective system for peacetime maintenance training which overcomes the severe handicap of a two year conscript army serving without experienced NCO's and career enlisted men. How the system would work in wartime when line units had no time to train is questionable.

## INTRODUCTION

In today's environment of limited resources, inflation and energy constraints, how much a nation can afford to invest in the upkeep and modernization of an effective ground army is a question that goes to the very heart of a nation-state's policy-making apparatus. The cost of a conventional war machine is high. Competition for scarce resources is keen. New technologies combined with training lead times and personnel turnover are a constant drain on national wealth. With the continuing search to cut costs and with recurring demands for increased sophistication in military state-of-the-art, governments are looking harder at what it takes to train a soldier in a technical skill.

The Union of Soviet Socialist Republics has more than 170 separate ethnic groups with more than 200 dialects and languages. From this potpourri of over 255 million people, a large, modern and powerful military force is maintained. The USSR is faced with the problem of choosing the optimum methodology for training the best military technician in the shortest possible time and keeping that state of training high. In addition to the problem of people and their training, the Soviet Union traditionally has been faced not only with its own desires to modernize and industrialize, but also with a perceived threat from the technologically superior capitalist world. The Soviet ground forces are modernizing and receiving new equipment which requires greater technological expertise. Technical training in the Soviet Army has had to respond to both modernization and diversification.

The demands of evermore complex and sophisticated materiel place a burden on any army which tries to maintain modern military hardware. The Soviet army is attempting to meet this burden with greater technical expertise based on an extensive and integrated program of training, both in service schools and in line units.

It is the purpose of this paper to examine Soviet training methodologies for maintenance and repair of equipment. In the process a larger picture will emerge. The training of mechanics is not that different from the training of other technical specialists. The procedures and methodologies used have value beyond maintenance training. They are universal and applicable to many types of training under a Socialist system. Perhaps some of the information provided here will generate ideas and lead to an improvement in the training of US Army technical specialists. If nothing more, knowing what the "other side" is doing will give greater perspective on a mutual problem and point out another series of differences between two contrasting ideologies.

## THE TECHNOLOGICAL IMPERATIVE

At no other time in history has the world changed so much within such a short time. The technological revolution has been a geometric progression of new information and scientific applications. Grandparents can talk of seeing their first airplane and automobile and if they grew up in a rural area they can remember when electricity first came to their homes. Parents talk of the first television, first jetplane and first plastic toys, all while their children remain blase to space travel and transistors. Yet, all this can only be found in the most industrialized of nations. In this context of historical compression the Soviet Union has been struggling to industrialize.

Russia in 1917 was a backward country. With the Communist takeover the modernization effort increased. Socialism and the building of Communism gave new methods to the goal of modernity. Technical development was and is an essential part of modernization and more specifically an essential part of military modernization. Technical training goes hand in hand with technical development and stands as a key to the building of a modern army for a modernizing nation.

Marxism-Leninism provides the philosophical underpinning for military technical training. Soviet military science views the role played by man and equipment in a modern war as being one. Lenin is continually quoted and referred to on the importance of studying equipment and weapons. Soviets emphasize that moral strength can be transformed into material strength through the application of excellent organizational work. That organizational work becomes the role of the Party.

### The Role of the Party

Specialized and technical training for soldiers has become political in nature. The entire Soviet system of pedagogy is so enmeshed in the teachings of Marxism-Leninism that pedagogy cannot stand alone. In military endeavors the concepts of "ideological spirit" and "Communist courage" cannot be separated from "technical culture" and "technical training". The organization of party-political work takes place at all levels within the military hierarchy. Military training and Communist Party activity have become closely intermixed. Lieutenant General A. Shelepin, then Member of the Military Council and Chief of the Political Directorate of the Transcaucasus Military District, stated:

It is completely obvious that within the overall system of our activities directed towards troop combat readiness, greater attention is being devoted during party-political work to those questions concerned with studying the combat equipment and ensuring that it is properly maintained and skillfully employed on the battlefield. We view this problem as being important from both a military and moral-political standpoint. The political organs and party organizations are devoting a great amount of effort to ensuring that dynamic efforts in the development of weapons and combat equipment and in the methods to be employed in an armed struggle, serve to promote the political vision of the soldiers and also their moral-psychological and combat conditioning.<sup>1</sup>

It is the position of the Communist Party of the Soviet Union (CPSU) that a scientific world-outlook gives their fighting men a solid basis for understanding laws which they claim govern the development of nature and society. These so-

called natural laws are the foundation on which communist consciousness is constructed. It is considered to be the motivating force behind the heroic exploits of the Soviet people in defense of their motherland and the most reliable weapon in the struggle against bourgeois ideology. Therefore, it is to the formation of a scientific world-outlook in Soviet fighting men that the entire system of political training in the Armed Forces is directed.

In the Party's view, present day scientific-technical progress, the fundamental changes in military affairs, the continuous improvement of weaponry and military technology place immeasurably higher demands on the level of training and education of personnel, especially with regard to the moral-political, technical, and psychological hardening of the fighting men. As a result of the existence of complex modern technology and weaponry among the troops political training has been integrated with technical military education.

Colonel V. Mikheyev pointed out:

Critical tasks confront the personnel of the Armed Forces. Their successful solution depends, to a considerable degree, upon the level, scope, and effectiveness of political and military education, upon the involvement in it of the broad masses of Communist Party members--the genuine political warriors of our party.<sup>2</sup>

Every institution within the Soviet Union is permeated by the Party's organization and influence. The civilian educational system responds to Party requirements. Scientific and technological disciplines have a special priority in schools. Political and military education begins well before entry into active service. The soldier-mechanic is conditioned from childhood and made pliable for training through Party-directed programs. In the words of the late Marshal of the Soviet Union, A. A. Grechko:

Even before they are called into the army, Soviet youth are instilled with deep communist convictions and awareness, as well as with a feeling of personal responsibility for the destiny of the Motherland.<sup>3</sup>

Of course, Grechko speaks of the ideal. Examination of methodologies and pedagogical techniques will show that much of military training is an effort to instill what the soldier is supposed to have before he enters service.

The Voluntary Society for Cooperation with the Army, Air Force and Navy (DOSAAF) conducts a pre-induction program which, since the reduction of the conscription term of service in 1968 from three years to two, is now mandatory. DOSAAF attempts to train teenagers in skills needed by the Armed Forces. It is also a coordinating agency between school, job, local government, Party, Komsomol, trade unions, and local military units.<sup>4</sup> The pervasive Party is present also in DOSAAF and the individual is conditioned long before call-up to the practices of applied Marxism-Leninism. By the time call-up takes place the draftees have been conditioned mentally for service.

Grechko goes on to say:

From the first days of their arrival in the Armed Forces, the young people very enthusiastically begin to study military equipment and master the science of armed defense of the Motherland. Their enthusiasm for

steadily increasing the combat readiness and combat capability of the Soviet Armed Forces is supported, developed and skillfully directed in every possible way by our commanders, political organs, and Party and Komsomol organizations.<sup>5</sup>

The role of the Party in Soviet military technical training is all encompassing. There is no facet of Soviet life to which the CPSU cannot be connected. Teaching and the learning process is no exception. The specific techniques and psychological manipulations used will be covered later. For now, the important point is that what appears to be an enormous amount of time spent on political training is in fact an integral and vital part of a greater and more functionally purposeful training program. The Communist Party dictatorship has total control over political, cultural, economic and military life in the Soviet Union. It follows that education both inside and out of the military establishment serves the interests of the Party.

#### The Ideological Foundation of the Application of Technology

The growing interdependence of men and machines on the modern battlefield is the reason for increasing technological emphasis within the Soviet Armed Forces. However, the realization of the need for modern equipment and hardware is not unique to military requirements but rather a reflection of the Soviet national imperatives of industrialization and material development. Cultural importance is given to technology and the soldier enters military service with a technical value structure created by the Party. Science and its applications have a special place in the molding of Soviet man.

In the Soviet view progress has acquired the form of a scientific and technical revolution and has produced a qualitative change in the productive forces and the material means for waging war. According to N. Alekseev, Colonel General of Engineers, Deputy Minister of Defense of the USSR:

The present day equipment of the army and navy have also substantially altered the nature of military service. Military service today not only requires great physical endurance, it also requires psychological stability, substantial mental exertion, and broad technical knowledge. Our Armed Forces are so saturated with sophisticated equipment that a high degree of technical competence has become one of the main indices of troop combat readiness.<sup>6</sup>

Soviet military literature repeatedly points out a form of technological ethic. Equipment is the basis of the army's combat might and intelligent operation and careful maintenance of it is of great importance in maintaining combat readiness and creating conditions for its effective employment.

Chief Marshal of Armored Troops, Hero of the Soviet Union, A. Babadzhanian extolling the need for technical training explained:

Special attention in a study of the equipment must be given to the operation of mechanisms and their interworking, and to the possible malfunctions and to eliminate them. Only on this condition is it possible to learn to make full use of the technical capabilities of the vehicle and "squeeze" everything

out of it that it can give. It is the most important task of any crew to regularly improve their theoretical knowledge and practical skills in servicing and repairing a tank, infantry combat vehicle or armored personnel carrier, in driving them expertly at high speeds both in a column and in combat formations, in different terrain conditions, time of year, time of day and weather, and in skillfully crossing all possible obstacles and barriers.<sup>7</sup>

The tasks which Marshal Babadzhanyan wanted accomplished can be achieved only through a high level of technical training and regular practice.

The development and improvement of the training material base is the basis for Soviet improvements in training methodology. This permits creation of a situation which approximates the conditions of real combat to the maximum, which allows the assurance of teaching technical skills to two year conscripts, and the successful application of those skills, all while psychologically conditioning those who serve.

Before the Soviet Army repairman's training can be studied, the general attitude of the Soviet Army towards technical training must be understood.

A high degree of tactical training is unthinkable without exemplary mastery of equipment and weapons, and without the full use of their combat characteristics. In this regard we can clearly see the important role of weapon, technical and specialized training.<sup>8</sup>

By specialized training Grechko no doubt means chemical, biological and nuclear. Technical training is an all-encompassing term which includes maintenance and repair as well as almost anything that involves the use of operation of equipment and weapons.

The late V. D. Sokolovskiy, Marshal of the Soviet Union stated:

A future war will require an approach to the use of the human contingents of a state that differs from the approach used in the past. Modern complex military equipment requires a large number of maintenance personnel, particularly engineers and technicians.<sup>9</sup>

After telling of the increases in numbers of technical personnel in the Soviet Armed Forces since the Second World War, Sokolovskiy claimed that this was "undoubtedly due not only to the complexity of modern military equipment, but to the ever-greater degree to which the Armed Forces are technically equipped."<sup>10</sup>

#### The Polytechnization of Instruction

One of the most pressing educational problems in the Soviet Armed Forces is the training response to the increase in technical equipment. The text, Military Pedagogy, one of the "Officer's Library" series published in the USSR, covers this issue:

...the increasing complexity of new combat equipment and weapons has led to a sharp increase in the role and significance of the theoretical knowledge of specialists and hence to significant reorganization

of the entire system for theoretical training of personnel. Under current conditions it is not enough to know the design of new equipment well and to acquire practical skills in operating it in order to master new equipment and weapons thoroughly and comprehensively: for this purpose it is also necessary to master the scientific and theoretical principles of its design and operation. ...Under current conditions, knowledge of the physical principles of the design and operation of basic systems and instruments is even more necessary in order to operate and maintain equipment correctly and competently.<sup>11</sup>

With the rapid introduction of new end items the technician and especially the technical manager cannot keep up or maintain the needed expertise on all pieces of equipment. In addition, the complexity of modern weapons systems prohibits full mastery of even one type item by one individual. There is just not enough time to become fully versed in every phase of its electro-mechanical subsystems. The individual soldier or officer who knows basic principles can apply them when needed. In the field and under conditions not formally covered in training, the technician must be able to fall back on universal principles for guidance. There will be a time when an individual doesn't know what to do and unless his training and education are broad enough for him to develop his own procedures for the occasion, he will be unable to solve the problem.

Due to the current technological state of the art, extensive effort is being made to meet training needs through what is called the principle of "polytechnization of instruction." According to Soviet writings:

The requirements of this principle are, first, that the process of technical instruction be founded on the study not only of specific models of equipment, but also of generalized diagrams of the latest technical achievements. Second, the process should orient the students more toward the development of technical thinking, independent study of technology, and more mastery of prospective models.<sup>12</sup>

It is not the goal of polytechnization of instruction to make an individual an expert in all fields; rather, it is to develop in soldiers the skill to work as a team member as well as an individual. What the Soviets term "collectivism" is the desired result of polytechnization, that is, collective activity resulting from the study of related specialties:

The current scientific-technical revolution has greatly heightened the collective character of the maintenance and combat application of equipment and weapons, and this has immeasurably increased the responsibility of each soldier and his role in the successful fulfillment of the tasks of the entire subunit.<sup>13</sup>

The concept of the collective in both training and application is fundamental to the Communist system. Collectivism is a way of maximizing unit integrity and esprit de corps through consideration of common and individual opinion in unit "discussion and selection of the best decisions, conclusions, and proposals, comradely criticism and self-criticism."<sup>14</sup> It is a psychological technique to control human interaction.

Of course, officer and enlisted training have different objectives but the

principle of polytechnization of instruction is applicable in both cases. Officer training schools mix hands-on problem solving with classes in science and technical theory. With the enlisted term of service now standing at two years, a great deal of the training is done in the unit with the unit mission itself being the training environment. In either case both officers and enlisted men are products of training methodologies rooted in the philosophy of Marxism-Leninism.

### Socialist Duty

The Soviet economy is based on the theory of public ownership of the means of production. Socialist property is owned by the collective of the body politic and takes a spiritual value which is every bit as materialistic as the capitalist world's monetary values. "The Communist Party has placed great importance on the protection of socialist property and to the absolute observance of the principle that it is holy and inviolable."<sup>15</sup> Article 61 of the Constitution of the Union of Soviet Socialist Republics obligates citizens of the USSR to preserve and protect socialist property. Article 61 also points out that "persons encroaching in any way on socialist property shall be punished according to the law."<sup>16</sup> The military oath also requires every fighting man to swear to take all steps necessary to preserve military and national property.

The protection and preservation of socialist property is carried out by various methods. Appeal to a sense of duty is one technique, however close daily supervision enforces the legislation and regulatory statutes. Great importance is attached to education and responsibility towards equipment. Lieutenant General of Artillery, V. Lebedev, uses the legalist approach as well as the psychological in his efforts to raise levels of technical knowledge and maintain resources.

Every serviceman must recognize his responsibility in this regard. It is the duty of every soldier to have a zealous, thrifty attitude toward material valuables, and to competently operate and expertly conserve equipment and armament. Proper operation of modern equipment inescapably requires not only irreproachable knowledge of it and of the relevant documents regulating its use, but also a deep understanding of the nature of processes occurring within it, and a lucid understanding of the work of each system, machine unit, device, and mechanism.<sup>17</sup>

Combat readiness in the Soviet Armed Forces relies on Communist inspiration to give the troops a sense of involvement. Technical training and maintenance stand as critical components of combat readiness. Troop motivation within the Communist system at times appears to be the prime concern. Training programs are laced with some subtle and many not so subtle ways to make the soldiers care about what they do. The late Marshal Grechko stated in 1973 at a speech to the All-Army Conference of Secretaries of Party Organization:

We must carry on concrete political work directed at improving the maintenance and operation of weapons and equipment, perfect the preventive maintenance system and the organization of motor pool maintenance days, mobilize people to reduce the time required to learn how to use new equipment and attain a profound knowledge of the potentials of each type of weapon, to indoctrinate in

personnel a love for their weapons and the ability and readiness to use them to maximum, and thus obtain from them everything expected of them.<sup>18</sup>

The indoctrination in personnel of collectivism in both the training and combat environments assumes a moral quality in Communist perspective.

How the Soviets increase the technical competence of personnel in order to successfully conduct maintenance and repair functions cannot be studied without an understanding of Communist morality and the concept of socialist duty. The combat readiness of troops and equipment in the Soviet Armed Forces is political as well as technical. Ideology is an instrument in the achievement of technical means. Those same ideological objectives and ends for which technical means are oriented serve to perpetuate themselves. This cycle of Marxist-Leninist religiosity will become more evident as specific methodologies of Soviet technical education and training are examined.

## ACHIEVING COMBAT READINESS

The readiness of equipment and armament is an important component of overall combat readiness. Combat readiness of equipment in the Soviet Ground Forces depends in many respects on a well organized system of rear support which is fully integrated with the line unit's own efforts to support itself. Soviet logistics and the entire system of rear support are important in achieving combat readiness. To emphasize maintenance over other service functions may well lead to a distortion in perspective; however, to gain an understanding of maintenance training this paper will view the functional system only in terms of technical maintenance.

### Maintenance Defined

According to Reznichenko:

Technical maintenance consists of maintaining all forms of combat equipment and armament in proper condition and in constant combat readiness. It involves the organization and realization of technically correct use, servicing, and storage of weapons and combat equipment and in carrying out their timely repair and evacuation.<sup>19</sup>

Most significant in Reznichenko's definition is the "realization of technically correct use". It is here at the organizational-user level that the maintenance system begins. It starts with proper operation! The idea of instilling in the driver-operator an attitude that equipment care and correct use are forms of maintenance is most significant.

Other Soviet writers expand on explaining maintenance and define it in terms of purpose:

Maintenance, as is known, is performed not simply to find and prevent troubles, but also for purposes of performing a variety of preventive measures designed to provide specified parameters for assemblies and systems within the limits of established service lives. A basic purpose is to ensure failure-free operation of equipment and armament for the time that is to elapse between scheduled maintenance periods, and to keep them failure-free during long periods of operation.<sup>20</sup>

General Reznichenko provides an insight into the actual performance of maintenance in the Soviet Army:

Maintenance is conducted in the subunits directly by the crews of tanks, drivers of motor vehicles and also by the crews of cannons and mortars. To assist the subunits in the maintenance of machines and weapons, personnel and equipment can be sent to them from the repair shops of battalions and regiments.<sup>21</sup>

The tactical line units perform technical maintenance with their own resources. Service elements support the front line units when complexity of work is beyond organic capabilities. Rear support for maintenance is explained in general terms by Reznechenko:

Repair units and subunits are broken down according to the character of their work into artillery, armored, and automotive workshops, workshops for repair of clothing and personal equipment and others. They conduct current, minor, and major repairs. Armored workshops possess evacuation means and, besides repair, carry out retrieval of damaged equipment.<sup>22</sup>

At line unit level there is usually an organic repair workshop which is intended for maintenance and current repair of the wheeled and tracked vehicles of the unit. This unit workshop, under the deputy commander for technical services, is responsible for providing rear support to the user-operator.

### Training Procedures

Manpower procurement in the Soviet Union is based on the 1967 Law of Universal Military Service. This results in a draft of eighteen-year-old men in increments of six months. Those not drafted go into the reserves. Draftees usually complete an initial four-week training period and then are assigned directly to operational units. This places the major burden of training on the line unit itself. Every half year a new group of recruits is sent to the unit and basically, 25% of the organization's manpower must be taught their jobs.

The on-going yearly training program works on a cycle of winter and summer periods. Each in turn are divided into various stages with specific themes or objectives. The fact that the entire unit must bear the burden of skill indoctrination to the new soldiers is most significant. The non-commissioned officers are usually made up of draftees in their last quarter of service. Long years of experience are not available in the NCO ranks. The burden of training rests on the officers.

Various training methods are used within the Soviet Armed Forces. There is no one methodology, no matter how effective, which is universal. There is a constant search for the most effective combination of methodologies and techniques. The development of general training theory is an issue of importance and the practice of accelerated teaching is a subject to which Soviet military journals devote a great deal of space. For example, one article points out:

Meanwhile, as we know, the limit of training time for preparing the soldier specialist is not increasing. Moreover, by virtue of a large number of circumstances, it has a tendency to be cut back. One of the most important ways for eliminating this contradiction is to search for, elaborate and adopt new and more effective forms and methods for training soldier-specialists.<sup>23</sup>

The two-year service obligation has put a great deal of pressure on all elements of the military system to raise technical skill levels rapidly. The military commissariats have increased responsibilities placed on them to come up with higher quality and more technically oriented draftees. Schools, collective farms and the DOSAAF organizations are looked at to provide higher levels of pre-induction technical expertise. Colonel S. Nakashidze tells:

In recent years we have begun to devote more attention to the military-technical training of future soldiers. Military commissariat officials are struggling to ensure

that draftees have a technical specialty. At our recommendation, many of them study in DOSAAF schools and clubs. Here, under the direction of experienced mentors, they study radio and various types of equipment and take part in marksmanship circles.<sup>24</sup>

DOSAAF can at best do only basic training tasks. Large numbers of technically competent individuals go on to higher training and/or universities and avoid the draft. It remains, therefore, for the military to train its own technicians. Normally this is done in a tactical line unit.

Central to the Soviet technical training effort is planning and organization. There is a basic single document used in the Soviet Army for planning of training. In this booklet-like document of blank forms, each training subject is allotted a certain number of hours, distributed according to class themes. The booklet has several divisions and if properly filled out it can be exhaustive and detailed. It is called the schedule of classes and as described by Colonel V. Kudryavtsev:

The schedule confirmed by the superior officer becomes the law of training and combat activity, the law of its whole life. That is why it must answer all requirements presented to training of the personnel at present. Above all it must reflect the class themes that are provided for by the training program. The subject of training, the theme and the brief contents of the class, the method, the time and place where it will be conducted, the instructor, the training appliances and adequate provision of materiel are indicated in detail in the schedule.<sup>25</sup>

These training booklets are maintained as low as platoon level and give a record of progress of each soldier as well as outline of each class taught.

Marshal of Artillery G. Peredel'skiy advises:

The technical training plans for each duty category must include a definite list of questions dealing with the installation of organic models of armament and equipment, with ammunition, with preparing these latter for combat use, with maintenance, and so on. It is useful to include in the annexes to such plans concrete lists of what each specialist must know, and what practical work he is expected to perform. What also must be determined are the questions it is deemed desirable to study during independent work, and the control dates for taking technical training course credit tests on service manuals, technical descriptions, and operating instructions.<sup>26</sup>

Planning technical training according to Soviet doctrine requires that general tasks be formulated for the new training year and then the performance sequence be correctly determined. At this same time dates are linked to tasks, and times and places for technical training sessions are determined. This entire procedure is spelled out in the Internal Service Regulations for the Armed Forces of the USSR.

Colonel General K. Grushovoy, Member of the Military Council and Chief of Political Administration, Moscow Military District, outlined techniques for technical training used in his district:

Well-organized technical training depends on the level of technical knowledge of the officer, as well as his ability to get this knowledge across to his subordinates. The most important aspect of perfect mastery of methodological skills is the continuous increase in the volume of technical information that must be absorbed by personnel during their period of service, and this requires that drill leaders intensify such drills to the maximum extent possible.<sup>27</sup>

In order to meet the demands of increased knowledge and shortened time periods, Grushevoy points out that various methods are implemented by both the command and Party organization. "Questions concerned with increasing the technical military knowledge of the officer corps, and with personal examples set by the Communists and the Komsomol members, are systematically discussed at Party and Komsomol meetings."<sup>28</sup>

Technical study groups are formed and meet on a regular basis in those units which take the initiative to follow techniques and methods suggested by the Party. Technical study groups have lectures, give reports on technical military subjects and issue technical bulletins. Communists within a unit are encouraged to discuss their maintenance problems at Party meetings. It is felt that this not only leads to solutions, but also improves the technical "culture" of personnel.

Technical military propaganda is another means of training outlined by Grushevoy. Here the Party organizes sections to propagandize technical knowledge. Lieutenant General I. Repin, First Deputy Commander of the Ground Forces Political Administration, tells why military-technical propaganda is considered as an important component part of all Party-political work:

With the qualitative changes which have taken place in military affairs and with the content and method of training and indoctrinating personnel being perfected, military-technical propaganda is being improved in every way possible. The purpose of this propaganda is to explain the essence of scientific and technological progress as well as its effect on military affairs to the personnel. It is also directed towards developing the desire in the soldiers to study combat equipment and weaponry, familiarizing them with the newest achievements of science and technology in our nation and abroad, and improving the quality of the study of weapons and equipment, their maintenance and their use.<sup>29</sup>

The graphic propaganda which Repin refers to might well be classified as nothing more than training aids and charts, but the role of the Party and ideological implications make this form of teaching unique to the Communist system of training. An example of technical military graphic propaganda is described by Colonel-Engineer Ya. Fayemov. He tells about carefully developing plans and charts for making repair operations:

These charts indicate what should be available and what jobs must be completed before a certain operation is carried out, what the officers, NCO's, and soldiers must know in accordance with their functional duties. These plans also indicate which measures should be taken in

line with the Party and Komsomol organizations in order to motivate personnel to perform repair operations with high quality, how graphic propaganda work should be done, and illuminate and publicize the course of maintenance operations.<sup>30</sup>

Technical conferences have a significant place among the teaching methods used by the Soviet Union. As a form of popularization of technical subjects they promote what can be called a deepening of knowledge about combat materiel by raising questions which require collective solutions. Commanders, political workers and Party organizations prepare and lead the conference. They select a theme for the conference and help the speakers with their preparation. In addition they prepare displays and organize the sale of technical literature. Recounting one such technical conference, Colonel A. Patarov said:

All participants dwelled on the questions concerning further perfection of the methods of equipment use and maintenance, keeping it in constant combat readiness. The troops shared their experiences, told of achievements and of training methods which promote the growth of combat skills. The experienced driver-mechanics paid particular attention in their addresses to shortening the time for fulfilling the standards concerned with the preparation of tanks for submerged driving.<sup>31</sup>

Achieving high quality care and maintenance of weapons and equipment is the desired result of maintenance training. The methods used to attain this goal can be viewed in terms of hard skill instruction and the less tangible adjustment of attitude. Most Soviet methodologies are a combination of both and a clear dichotomy is rarely evident. People are encouraged, rewarded, cajoled, threatened, punished and praised to perform in the desired manner. All may occur at the same time.

The Soviet Army has very detailed regulations for maintenance of materiel. The threat of an examination or inspection is a tool to encourage learning. One view of this form of motivation emphasizes that:

The rules of maintaining combat vehicles, assemblies and instruments are accurately set out in instructions and manuals. The strict and unwavering observation of their requirements is law for all personnel. Systematic preventive inspections, the cleaning and repair of items, the timely detection of defects and their skillful and quick elimination are the most important conditions for insuring their proper functioning and operation without a hitch. A complicated apparatus always needs to be checked, accurately tuned, and regulated. Otherwise it is impossible to keep the mechanisms and devices within the limits of established tolerance.<sup>32</sup>

A modern training facility which allows the full training and indoctrination of skilled specialists is the focal point of much of modern Soviet methodology. Specialized classrooms and good mock-ups backed by elaborate training aids and devices serve to embellish the various techniques used to teach equipment and weapons. An overall view of the interrelationships necessary to implement Soviet technical training methods is touched upon by Engineer-Major General V. Galev:

Only a master of his work and a high class specialist is capable today of maintaining the very sophisticated and costly equipment and ensuring its continuous combat readiness. And genuine masters are developed where technical training has been well run, where a modern training facility has been set up, where continuous and concerned care for equipment is ensured, and all forms of its maintenance prescribed by operating instructions are conducted with high quality. The attention of the command element, political organs, staffs and Party organizations now are being directed to solve all these problems.<sup>33</sup>

### Socialist Competition

Throughout all sectors of Soviet society the concepts of socialist obligation and competition are used to insure completion of various tasks. Usually an obligation involves meeting some pre-established norm or exceeding some old norm by a small amount. Socialist competition occurs when a group of people review their obligations, plan new goals, and initiate a competition with other groups for the fulfillment of some task. In theory this results in the successful fulfillment and over-fulfillment of socialist obligation due to the factor of competition. In short, socialist competition is a technique of using peer pressure to force individuals into obligations and then using competition and more peer pressure to get them to meet it.

The military application of socialist competition has been explained as follows:

The basic concept of socialist competition in the army lies in developing a conscientious attitude among the fighting men for the fulfillment of service obligations, a spirit of competitiveness and healthy competition. Competition spurs the fighting men to take their example from the best people, to raise the quality of their combat and political training, and mobilize the fighting men for outstanding handling of equipment, to raise class qualification, and facilitate a strengthening of military discipline.<sup>34</sup>

An obligation is the word given to the Party and the homeland. The Soviets feel that competition raises friendly cooperation and mutual assistance among the members of a unit and strengthens military collectives. It is felt that the social role of competition is extremely significant since it brings about a higher level of political consciousness.

Socialist competition is an essential part of technical training. When telling how the majority of soldiers and officers serving with missile and artillery units had successfully carried out their socialist obligations, Lieutenant General D. Petrov explained:

The main factor for these successes was the continuing improvement in the methods of teaching and the material training base in the implementation of know-how in teaching and education, and the organization of socialist competition.<sup>35</sup>

A socialist pledge is, in most cases, a complex outline of what a soldier will

try to accomplish in a training year. The pledge obligates individuals to long-range personnel improvement schedules. It is created in the unit and is written down as well as posted for display in a prominent location. In a training environment pledges state what level of qualification a given specialist should reach, what he should know and what his performance level should be to raise his proficiency rating. A portion of one sample pledge taken in a tank company at the start of a training year stated:

...possess excellent knowledge of and excellently maintain weapons and combat equipment; use them skillfully, achieve exemplary performance of combat training tasks, master adjacent skills, have 100 percent of the men proficiency-rated specialists by the end of the year, including at least 88 percent 1st and 2nd class.<sup>36</sup>

Socialist competition operates on what is termed the Leninist principles, i.e., publicity and comparison of results. Both the good and the bad are recognized. All training activities are performance oriented if in no other way than the memorization by rote followed by recitation of check lists or procedure sequences. Those individuals who perform the set task well receive praise and public recognition. Those who don't meet the standard are openly chastised and at times even ridiculed.

Marshal of Artillery Peredel'skiy pointed out:

Full use must be made of the tested method of socialist competition, competitiveness, in order to raise the level of technical and special training. After all, there is no such thing as a drill, or a training day, that is completed, or that passes, without leaving behind it some trace, without there being some reason for discussing who was outstanding, or who was lagging. Quite the contrary. Army week-days are filled with a host of noble deeds and acts on the part of the soldiers, sergeants, and officers, of the praiseworthy and those who do their duty. Everything depends on the ability of commanders and political workers to recognize the zeal of subordinates as they go about their daily tasks, to give them timely backing, and to do everything that is necessary to see to it that the scope of the competition is constantly expanded.<sup>37</sup>

Publicity is a key to socialist competition. Results are announced regularly. Not only are the shortcomings published along with the achievements, but each error is used as an example showing what not to do. One account states:

The special posters which hang in each subunit are imbued with the spirit of intolerance towards shortcomings wherever they may appear. The names of the soldiers who are retarding the movement forward are presented on them in big letters. This is how they implement in this harmonious group the instructions of the General Secretary of the Central Committee CPSU, L. I. Brezhnev, that "socialist competition, being the living creation of the masses, requires

not only the active support and rewarding of the leaders but also the disclosure of those who lagged or are not laboring in a sufficiently conscientious manner. And this should be done publicly, openly, so that the people know not only those who work with a complete output of effort but also those listlessly, without strain."<sup>38</sup>

Competition encompasses literally all aspects of the life and activities of a subunit; it is an inseparable part of the training process. Socialist pledges are taken by the troops for the entire period of training and also for the execution of specific tasks and time-performance norms. Pledges are taken for specific field exercises, weapons firing at the range and even performing guard duty. When the soldier assumes his individual pledge he is very much aware of the indices for which his squad, platoon and company will be competing. He knows what his personal effort will contribute to his unit in whatever type of competition they are then engaged.

The results of a competition are summarized in a ceremony. Photographs, bulletins and leaflets are issued about the results. Radio and newspaper coverage is given to the event and the commander usually gives incentive awards to those who have distinguished themselves. Under some conditions these can be expensive watches or fancy cigarette lighters.

Colonel Sul'yanov in explaining competition as a factor in education points out the need for "quality propagandizing":

The force of example is great. However, propagandizing the achievements of outstanding personnel in combat and political training should not be replaced by a hullabaloo of empty words. The educational importance of summing up the results is intensified even more if, in the unit or subunit there is complete revelation of all shortcomings and omissions, if they are evaluated in a well-principled manner, and if, in combatting them, active use is made of criticism and self-criticism.<sup>39</sup>

The Party and Komsomol organizations require that their members set an example for all others in creating and fulfilling obligations. The Party committees give many of the Communists individual assignments and thus force them to meet higher goals than average. In the case of technical training, they must systematically refresh and update their military knowledge, study innovations and read assigned literature.

Lieutenant General Mednikov, Member of the Military Council and Chief of Political Administration for the Group of Soviet Forces in Germany, gives an example of technical training in Army-Navy competition:

Socialist competition in skilled use of equipment and weapons has developed along a broad front among the troops that comprise the Group of Soviet Forces in Germany (GSFG). The men of the Guards Chertkovskiy Tank Regiment, who were the first in the Group to take up the challenge of the Northern Fleet sailors, have taken an obligation to steadily expand their technical knowledge, to use their combat vehicles successfully, and to make sure their work is

dependable, no matter what the conditions may be. Every second soldier and sergeant, and all the officers and poroshchiks, decided to improve their qualifications during the year. The successful fulfillment of all obligations taken made it possible for the regiment to complete the training year with excellent marks.<sup>40</sup>

Socialist competition is a means of motivation and a technique for giving both rewards and punishment. In theory, soldiers initiate competition and pick their own obligations, but in practice, the Party and the commanders set the tasks and goals using the organs of the Party to make it appear that the event is spontaneous.

Cross training and teaching of other specialties is a by-product of socialist competition. With the unit doing much of the basic skill instruction, there appears to be a constant demand for individuals with multiple skills. The fact that almost 25 percent of any one unit are poorly trained new arrivals and another 25 percent are soon to be released from service, places a burden on everyone and especially the permanent party, to insure that the necessary mission-essential skills are always available. Socialist competition is the vehicle through which attempts are made to solve the problem. The chief of a technical maintenance point says:

Through their participation in socialist competition, many of our people have mastered related specialties. However, this matter, speaking honestly, is far from a simple one and we don't approach it with the concept "If you want, master it; if you don't want to, don't." For example, what benefit will be brought if a soldier assumes the obligation to master a related specialty if he has not mastered his own? It would appear that this type of competition does not bring any valid results. Consequently, we not only take the soldier's desire into consideration, but also his capability and the need for specialists. For example, related specialties are mastered primarily by those of our people who are masters of their basic profession.<sup>41</sup>

Each unit has a Komsomol organization and it is through this structure that much is accomplished. The normal military chain of command is supplemented by the Communist organizational effort. Soldiers in each unit have additional duties beyond what is found in a non-Communist army. The role of agitator is one of these. He is an individual Party or Komsomol member who works as a local spokesman for achievement of Party ends.

An account of how one unit agitator set the stage for upgrading obligations and intensifying training is provided by Lieutenant Aleksandrov:

The platoon agitator, Guards Private Avas Abdulikirimov, familiarized his comrades with the content of the resolution: "On Socialist Competition to Meet the XXV Congress of the CPSU in Worthy Fashion." They listened attentively, concentrating on his words. That same evening, and on the initiative of the secretary of the company's Komsomol organization, Corporal Vasilii Kalashnikov, there was a Komsomol meeting. Here they discussed how they could increase the effectiveness of socialist competition.

how to make that competition even more active, and how to make it yield even better results. Young Communists Guards Privates 1st Class S. Shil'banov and V. Petrov, Guards Privates A. Aliyev, S. Khalilov, and others, reviewed their personal obligations and then proceeded to take upon themselves even greater, more strenuous obligations.<sup>42</sup>

Socialist competition does not stand alone as the framework of the Soviet training and production process. It is but one important methodology in a complex of schemes and processes. Integrated with the program of obligations and competition is the use of innovators, rationalizers and inventors.

#### Innovators, Rationalizers and Inventors

In concept, collectives are active working groups that not only are productive, but show initiative and much creative ability in performing tasks. When a military unit conducts training it relies on collectivism as one of the many techniques for meeting its assigned tasks. A collective has a motivation system which, in theory, is outside the normal military chain of command. The principles of Marxism-Leninism provide for spontaneous motivation. Reality is somewhat different. Both military and political hierarchies enforce role playing and at times charade-like actions by selected soldiers. Aside from the role of agitator, three other very important roles in the training process are those of innovator, rationalizer and inventor. These are nominal titles temporarily given selected individuals who aid in Party work.

Lieutenant General N. Vlasov told of the important role innovators and rationalizers can play:

District innovators, soldiers, sergeants praporshchiks, and officers, are taking an active part in many of the measures undertaken at the Armed Forces of the USSR level. They, for example, made a significant contribution to the competition on how best to equip work areas with machinery that meets the requirements of the scientific organization of labor. Everyone of the repair units and repair plants in the district took part in this competition. The results of all this activity was to bring about an average 4.2 percent increase in the productivity of labor on the part of repair personnel. Tens of thousands of rubles of state funds were saved. The Ministry of Defense of the USSR awarded certificates to many of the rationalizers, as well as to some of the units and the plants, for this work.<sup>43</sup>

Although General Vlasov is talking about increases in production, the same techniques are used to increase the levels of training. In fact, the terms innovator, rationalizer and inventor are economic in origin and have been adapted by the Party for military use. Training is viewed in the same light as industrial production and there is a similarity in methods used by both sectors.

An innovator is just what his name implies. He is an individual tasked with development of innovative ideas for increasing productivity. In most cases there is cross fertilization of ideas from outside the unit or injections of ideas from above and the innovator becomes more of an applicator than a creative thinker.

Rationalizers are work simplifiers or efficiency experts also oriented at increasing production.

Being an innovator or rationalizer is in itself a form of training. To be in such a position the individual must know what he is talking about in front of his peers. When given an assignment to innovate or rationalize, the person must learn enough to solve the problem or get others to support the solution at hand. One Soviet view points out:

Work experience shows that the participation of personnel in technical creativity lends itself to an attempt to always be on the lookout for ways to perfect training aids, operating methods, and the technology used to repair equipment and weapons. The process of creativity builds knowledge. Skills are acquired and the result is an improvement in the quality of what is in fact developed. The activity of the innovators increases. Confirmation of all of this is the fruitful activity of the rationalizers in our unit.<sup>44</sup>

Inventors are very much like innovators except that they deal more with physical or mechanical devices and less with organizational or systems approaches. In some Soviet writings rationalizers, innovators and inventors are almost synonymous. Since much of the activity of the Soviet Army is devoted to training, command and political sections devote a great deal of time and attention to rationalization and inventive work in order to make trainees more creative.

Much of the inventor and innovator work done is in the area of training aids and devices. The building of a mock-up or the equipping of a specialized classroom seems to be a standard project for inventors and innovators in a training environment. Service schools for officers use the same approach that is found in troop units. Having cadets or student officers serve as inventors, innovators and rationalizers allows them to experience what they will later be trying to get the enlisted men to do. Converting a salvage truck engine into a cut-away working model for use in training by a collective of cadets is a valuable learning experience and something they can later use.

Engineer-Colonel E. Malayev in writing about the training process and rationalization stated:

The main thing to be borne in mind, over and above the fact that the activities of the innovators have resulted in a significant improvement in the training base, and in an expansion in the field of scientific research work, are several other, equally important facts. Experience in working with these people demonstrates that the students who take an active part in rationalizer and inventor work usually are the leaders in training as well.<sup>45</sup>

Those who can do a good job motivating their peers can naturally do a better job motivating subordinates. The outgoing, gregarious soldier who is smart and can speak well will also be a natural motivator. When given the task of serving as a rationalizer or innovator a soldier must show his ability as a motivator and creative thinker.

The rationalizers and/or innovators work with inventors on problems placed

before them in terms of thematic assignments. In many cases tasking comes via the unit's commission on inventions. Lieutenant Colonel Rozanov told how this works:

As a rule, the work on the study of the new and advanced is headed by the commission on inventions. With the aid of officer specialists, their members make available to the personnel information on single, most urgent problems for the unit. No small role in the matter is played by the libraries of the unit. Of great value, in particular, are exhibitions of new arrivals of military-technical literature, recommended lists of works of special interest with annotations, and collections of notes from service conferences and meetings of the personnel. In many units one can become acquainted with informational literature in the rationalizers' corner or office.<sup>46</sup>

In other words, a group of soldiers under the direction of an officer task other soldiers to come up with solutions to technical problems. Research facilities are maintained in the unit and the soldiers tasked must learn before they can meet the requirement. Peer pressure and real life need are used to make a soldier spend time in self-study.

Socialist obligations can include a responsibility to come up with ideas. Five-Year plans require specific numbers of inventions to be introduced and developed. This type of planned effort is called creative labor and specific ruble amounts are predetermined to be saved by it. Goals are met one way or another and the creative groups of the various collectives respond to their assigned tasks and receive recognition and award for their efforts. What occurs in meeting a creative requirement as well as how a requirement is developed was described by Lieutenant Colonel I. Skal'skiy, then Senior Inspector for Invention Work, Ural Military District:

Much has been done in the tactical formation in which Major M. Mirgorodskiy is the secretary for the commission for inventions, as well as the Chelyabinsk Red Banner Higher Military Aviation Navigators' Academy, the Chelyabinsk Higher Military Motor Vehicle Command Academy, and in many other military collectives. Annual development of specific, clearly-worded subject assignments for rationalizers directed at solving the pressing technical problems has become the rule here. In fulfilling these assignments efficiency experts of the Chelyabinsk Higher Tank Command Academy have designed a number of valuable devices that help to increase the effectiveness of training cadets receive on motor vehicle and tank driving procedures on firing tank armament.<sup>47</sup>

Socialist competition, supported by the work of agitators, innovators, rationalizers and inventors provides one of the basic methods of Soviet training and achievement of combat readiness. The meeting of socialist obligations is an essential part of training troops for maintenance responsibilities and repair functions. Learning is involved with any of the roles played. Due to the conscript nature of the Soviet Army, the two-year turnover in troops, and the shortfall in a career non-commissioned officer corps, every innovative method and procedure that can increase training efficiency is sought out. Much comes to

naught, but what is used is productive. The Soviet Army is a highly technical mechanized force that is impressive by any standard. It is trained and maintained through a series of techniques that are common and well known in any modern army. However, in addition, Marxist-Leninist theory demands and creates a unique situation which allows for the type of spirituality found only in religious motivation. The socialist obligation stands as a Communist-peculiar approach to the difficult and complex problem of getting people to do what they otherwise might not do.

Lieutenant General Abashin gave an account of how training effectiveness is increased:

The daily lives and combat training of the troops assigned to the Red Banner Carpathian Military District are full of real creative activity. Successfully meeting the socialist obligations they have taken for this training year, they are obtaining excellent field training, are tenaciously working to perfect the processes involved in the operation, repair, and servicing of combat equipment and armament, are directing their creative efforts towards the development of a variety of simulators, training installations, and instruments that will enable them to increase training effectiveness.

Not only do the line units do most if not all of the training in basic skills, they also manufacture and design most of their own training aids and mock-ups. Maintenance training is considered to start with proper equipment operation, and the function of maintenance is a responsibility of all in service. The standard repertoire of both military and Party methodologies serve not only to foster technical training, but all other types of training as well. These are also the same types of techniques which are used to increase production in the civil sector as well as the military.

The achievement of combat readiness is in part determined by the quality of maintaining equipment and armament. Training troops to perform maintenance occupies a significant portion of the prime training time in Soviet line units. This is because proper equipment operation at the user level is felt to be the key to proper maintenance. Much time is spent training on hardware. Both the Party and the military command structures have oriented themselves to the importance of conducting technical training at the user-operator level.

## TECHNIQUES OF INSTRUCTION

The majority of the maintenance specialists or repairmen in the Soviet Army join their units from a basic training subunit. These subunits teach general military subjects and only an introduction to specialist training. Some men don't even receive that. The unit in which the men will serve their complete tour does almost all the training with instructors who are officers and sergeants. The sergeants in most cases are nothing more than second year soldiers who are usually in their last six months of service. The general training method is the lecture with demonstrations using assemblies, mechanisms, parts, chalk, boards, easels, diagrams and other training aids.

An overview of technical training programs reveal a general three-part approach. The first covers those disciplines basic to whatever specialty is being taught. The second is the actual study of the items of equipment and the operation of materiel. The third is the study of maintenance and repair. Not all units have clear-cut divisions in their training approach, but what is actually accomplished is what is important, not how it is organized on paper.

Particular attention is paid to learning the rules for handling equipment. Much of Soviet technical training time is spent learning routine procedures. This is augmented with considerable amounts of time given over to acquainting the trainees with the characteristic troubles encountered with the equipment, how to repair those troubles, tuning the equipment and adjusting it.

Training repairmen in a line unit is described by one Soviet source as follows:

Study of the questions of maintenance and repair should include lectures on troop repair organs, their composition, location of equipment and the organization on work. The deployment and striking of mobile repair shops and the methods used to make repairs to armament in the field can be taught as practical drills. Trainees should also be lectured on types of maintenance, when it should be performed and concrete operations carried out when maintenance is performed on equipment. At the same time, it is mandatory to devote some attention to those types of maintenance in which repair shop specialists participate.

It is recommended that practical repair work be undertaken only after the installation of models, safety precautions, and the repair technology have been thoroughly studied. The basic method of conducting drills such as these is independent work under the supervision of instructors on how to repair, adjust, and check the operation of individual sub-assemblies, units, instruments and sets of equipment under repair, using organic shop equipment.<sup>49</sup>

The training of repairmen at unit level is more than just lecture and demonstration. With a real-life mission to perform, the unit must maintain actual equipment while it is teaching the new soldiers their jobs. The level of sophistication of much of the hardware in the modern Soviet Army requires a level of training well beyond what a four-week basic training course and some unit level on-the-job training can provide.

It is interesting to note that the Soviet Army does not restrict repair tasks to specific levels of support in quite the same constraining manner as do some Western armies. It appears to be the rule that the repairman does as much as he can as far forward as he can and only when he can go no farther does he ask for support. Unit level instruction, as quoted above, includes levels of maintenance beyond that of the unit. The trainee is told what the repair shops supporting him do and how he can do it, too.

#### Unit Level Methodologies

Unit level methodologies for training in maintenance start with the user-operator. Lieutenant General-Engineer Yu. Ryabov said:

The habit of crew collective mastery must be developed in the very first few classes on servicing the vehicle, in preparing the equipment for call-out alert, and must be continued in the field. For this it is necessary to combine technical training with tactical gunnery and communications training. Crews must know how to independently and rapidly service tanks...Collective mastery is directly dependent on the level of individual training of the soldier-tanker...To teach a crew to perform even the simplest diagnostic work on the modern tank is not easy.<sup>50</sup>

The Soviets realize that in combat situations a unit has to operate frequently under conditions which separate it from repair facilities. Crews in battle have to fix their tanks themselves. This is why the real effort in maintenance training is at the unit level.

What crews are trained to do, including training and teaching others what to do, has been stated as follows:

It is impossible to maintain equipment in a condition of constant combat readiness without submitting that equipment to systematic maintenance which includes a host of technical and organizational measures. Technical measures include cleaning and washing special equipment, inspecting for and repairing damage, replacing lubricants in sub-assemblies, testing and checking instruments, and other work designed to restore assemblies to normal operating conditions and to keep them in that condition. Organizational measures include training personnel to perform individual types of work, outfitting workplaces with appliances, tools, and materials, and developing the technological processes optimum for the conditions prevailing in the particular subunit.<sup>51</sup>

The outfitting of workplaces is also the outfitting of teaching areas. Since much of the training is done in the line units, work areas become technical and maintenance classrooms. Operating display stands, posters and models of basic vehicles and other equipment allow the soldiers to acquire specific skills directly on the vehicles.

The facilities for working and teaching are in most cases a self-help project. Training aids and devices are made by the unit. Creating them is a way of

learning in its own right. The men of a unit exercise their creative ability and collective strength through the requirement to fabricate their own work aids.

A typical training-work area for maintenance instruction and repair functions has been described as such:

The repair personnel and efficiency experts made three work stands for each operation. Thus there are work stands for the disassembly and flushing of fuel and oil filters, for flushing air cleaners, for checking the fluid level of shock absorbers; for the removal of support bearings; to check and adjust the control drive of the main clutch, check and adjust the training mechanism, check and adjust the gear boxes and for readying the heaters for starting.<sup>52</sup>

Time is the impetus. Any device or technique that can make a soldier learn and learn fast is in prime demand. The task is to place new recruits in functional positions as soon as possible. They must be taught to perform and master their specialty quickly.

A system of ratings exists for each specialty. Norms are established for a rating and badges are given when the standard is met. One account of the process relates:

A stage-by-stage plan of preparation for taking exams for a class rating helps in the growth of a specialist's training. It defines the topical matter and time of work of the technical circles, of independent work on textbooks and service manuals, and the study of equipment during its maintenance. Effective plan fulfillment facilitates a deepening of the personnel's knowledge and an improvement in the skills and techniques of working on the equipment. In just three months many young soldiers successfully take a preliminary check of readiness to pass qualification exams. Therefore, there is no decrease in the number of rated specialists in the battery as soldiers go into the reserve.<sup>53</sup>

Achieving norms and becoming a rated specialist is an area in which socialist competition and obligations make a large training contribution. Once an individual achieves the basic level of qualification, he shows progress in training by upgrading his rating.

There is diversity in the forms that training can take. Each unit commander appears to utilize those techniques which he feels are best. One such approach is planned drills in the technical circle; a semi-informal lecture-discussion class of the unit's members, with a contest to see who is most knowledgeable about equipment and the rules for operating it.

Conducting the technical circle requires a planned effort. It is not spontaneous. Guidance on the proper way to run a circle includes:

The quality of the planned drills is highly dependent on the level of methods training received by the drill leaders, as well as on the individual training that

each trainee has received. Detailed knowledge of the material under discussion, as well as the ability to get the material across to the trainees, is required of the instructor, or leader. It is the latter that indeed plays a decisive role in the training process, through his ability to present the details of some particular question that may be raised in the course of a drill that cannot be foreseen. This requires the leader to analyze every lecture he is scheduled to give, each practical drill he is scheduled to hold, from the point of view of clarity of the material and the degree to which he grasps the material.<sup>54</sup>

In short, the instructor must make careful preparations for each drill. A lesson plan is mandatory and consideration must be made for the different levels of training received by members of the circle. In some units the circle concept is called a technical club. The idea is to get away from a formal class of instruction, however, Soviet journals give the impression that much of what is done in circles, clubs and conferences is in fact a well rehearsed and staged effort at spontaneity.

In one tank company 70 percent of the driver-mechanics became 1st or 2nd class specialists during the winter training period. This success was attributed to high socialist pledges, competitive situations in classes, officer and sergeant expertise, detailed planning in the organization of socialist competition, and the use of technical circles. An example follows:

A technical circle set up at the beginning of the training year on the initiative of the Party organization is a great help to the personnel in mastering technical knowledge. It is headed by Party member Warrant Officer Karnaushenko, a person in love with equipment. Classes in the circle are held once a week, on Wednesdays, during hours of independent training. All crew members are brought in for them, but primarily emphasis is placed on driver-mechanics and tank commanders. The circle's work plan is drawn up for the period in such a way that tankers reinforce program material and expand their technical horizons. In working in the circle, the soldiers thoroughly study such important matters as features of operating equipment under winter and summer conditions, types of technical maintenance of the tank and their periodicity, the system of hydraulic control and lubrication, and the fuel supply system.<sup>55</sup>

In addition to the technical circle approach, the tank company also used technical quizzes and evenings of questions and answers to spur the growth of technical knowledge. Komsomol activists published technical bulletins and gave recognition to the best driver-mechanics in the company. Other units hold technical conferences as a way to have short bursts of instruction before field exercises or some other type of operational event. These conferences can at times be likened to pep rallies. Individuals are filled with the spirit of technical and maintenance responsibilities.

With success in most all military operations being dependent to a great extent on equipment readiness, the Soviets fully integrate maintenance training with all other training events. In one motor transport company:

A technical conference was held several days prior to the exercise for the drivers. All drivers received much practical, useful, and essential information on how to preserve the vehicle and care for it, and on its operation under field conditions and in adverse road conditions. Mention was also made of the war experience, the actions of the military drivers, their heroic deeds at the front, and on the role of motor transport in carrying out delivery tasks during the course of battle.<sup>56</sup>

It appears that the initial effort is to have an open and enthusiastic conference. However, there is a strong tendency to structure all training and keep to schedules and plans. The Soviets obviously realize the value of a cooperative learning environment with exchange of information among peers. The problem is achieving that is two-fold. First, as already stated, there is almost an obsession with regimen and planning. Things must go according to some prearranged scheme. Secondly, the troops themselves usually do not have the knowledge to participate in a detailed technical discussion. It is up to the officers to provide the needed information. Therefore, although the effort is being made to have an exchange of ideas as a basis for learning, it is accomplished at the troop unit level only in terms of fundamentals and basics.

Preparations for marches are usually a reason for conducting special classes. Having a conference for the driver-mechanics is considered to be an essential part of march preparation. One account extols the value of this:

Driver conferences for exchanging know-how in operating the equipment under different conditions are of great benefit. The young drivers always listen attentively to the words of their more experienced comrades and learn from them how to operate in the winter cold and during the spring thaw, how to move in a column at night, how to take a vehicle through "contaminated areas" and how to maintain efficiency during the prolonged use of individual protection means. The implementation of these recommendations make it possible for each driver to insure the vehicle assigned to him operates without interruption.<sup>57</sup>

Not all technical conferences are limited to the unit level. They are conducted at battalion, regiment and even military district level. Here, commanders, their deputies for technical and political matters, and selected driver-mechanics attend. Reports of such higher level conferences are published and used as training literature and as "lessons learned" brochures. Various speakers give accounts of their experiences and explain how they have been able to raise the levels of technical knowledge for troops in their units. Conference members watch training films and see exhibits and displays.

Major General-Engineer (Reserve) P. Plotnikov tells why a technical conference in the Baltic Military District was a success:

In our opinion, the successful holding of this conference was facilitated by three factors. First, it was conducted according to a precisely developed plan. Second, the organizers achieved the fulfillment of all planned measures, and third, all personnel were brought into its preparation and conduct.<sup>58</sup>

Most significant of Plotnikov's three reasons is the involvement of all personnel. Learning takes place best when there is participation and commitment.

A major technical educational effort is oriented more towards instilling a love for equipment and a high sense of responsibility towards it than the actual tasks of a technical nature. The soldier learns his job on the job in what is called by the Soviets as an environment of technical culture.

The concept of technical culture is political in nature and used in the Soviet Army to identify a spiritual or mystical love that the troops are supposed to gain through training and hold towards their equipment. The political is always mixed with the practical. In one chemical unit:

There are periodic technical conferences, quizzes and exchanges of working experience of the best drivers and rated specialists with a practical demonstration of their dexterous actions with vehicles and instruments. In political classes and in briefing sessions, personnel are told about the heroic labor of our people to create first-rate weapons, about the advantages of our equipment and about how it lets down only those soldiers who show negligence toward it.<sup>59</sup>

Daily maintenance requires not only the training of the driver-mechanics but also building their desire to do a good job and take care of their vehicles. They are made to feel that everything depends on them and the general level of technical culture is such that they feel morally and politically obligated to their jobs.

Daily technical maintenance in most Soviet units is performed after the completion of vehicle operation with the goal of readying the vehicle to carry out new tasks. The role of the driver-mechanic is emphasized by Colonel-Engineer Serebryakov, who said: "The subject here is primarily the professional training of the drivers, their high ideological tempering and education which presupposes that each man has the desire to maintain his vehicle in a state of constant combat readiness."<sup>60</sup>

Major General V. Mitropov stated that:

Military technical propaganda is called upon to significantly supplement combat and special training without duplicating such training, to deepen knowledge and to impart to personnel a love for combat equipment, to indoctrinate them with faith in its power and reliability.<sup>61</sup>

Agitation and propaganda groups are led by political workers in a unit. Virtually all the officers are also agitators and propagandizers.

The methodology of organizing and disseminating military technical propaganda has become a necessary leadership skill in the Soviet Armed Forces. According to Mitropov:

The propaganda departments of the Marxist-Leninist universities are used extensively to improve the methodological skill of commanders and political workers where questions of propaganda about military technical knowledge are involved. Each year we see

a great many commanders, political workers, and officers assigned to the different services going to these night schools.<sup>62</sup>

Whereas there is no divergence between the political and the operational, there is also none between teaching and practice. Instruction is given in the midst of a field exercise. That same instruction is politicalized, yet the purpose of the ideological injection is to make the technical, non-political information more readily learnable. In other words, political methodologies are used to achieve practical, technical and functionally immediate ends; classes are given to teach a skill when the skill is needed that very moment by an operational requirement. It is a learn-by-doing environment, inspired with Marxism-Leninism. There is a dual purpose in training. The army is a school of communism, as well as an environment for learning military skills. Political methodologies are used to achieve technical ends in the same manner and at the same time that technical instruction is used as a vehicle to achieve political goals.

The hands-on, practical approach of doing a job under the guidance of leaders who can do it better is the real basis of the Soviet Army technical education system. Formal classes are injected into operational requirements. An example:

Recently personnel of this subunit were working at the moving target tank gunnery range. While crew commanders and gunners were carrying out firing exercises, Major G. Tkachenko held a technical training class with the driver-mechanics of one of the platoons. Servicing of tanks after firing began with precise assignment of tasks to personnel. During work on the equipment, frequent use was made of an effective training method; model demonstration with subsequent practical accomplishment of all operations.<sup>63</sup>

In a peacetime army the mission becomes that of combat readiness with unit training the prime occupation. With minimum individual training, soldiers learn from unit exercises.

What makes technical training in the Soviet Army a problem is the operational requirements placed on the unit while it must at the same time train its own specialists. This is especially acute in such units as Air Defense and Engineers which have peacetime missions well in excess of just training. Railroad units are another example of type units which must work at tasks other than training. Officers do a lot of practical, hands-on work themselves. Without experienced replacements or any significant career NCO corps the officers and praporshchiks must teach the troops rapidly or do everything themselves but the most simple tasks since troops do not have the skills. These demands have made the Soviet officer corps one that not only has many practical, hands-on type skills, but is also a corps of educators and teachers.

Formal classes are a ritual and hold a place of great importance in unit training. With work being done on almost an apprentice basis, the newer men in the unit have the imperative to learn as much as possible before those senior to them, whom they can now rely on, depart at the end of their terms of service. Since troops cannot spend the entire day in a classroom garrison environment, formal instruction must be mixed with mission requirements of the unit.

Conducting a class in the proper manner is a topic of considerable attention. For example, here is how one lieutenant prepares for and conducts technical training

classes:

He begins preparing for a class 3 or 4 days ahead of time. First of all he determines from the schedule when and where it is to be held, the subject matter to be covered, and how much time is allocated to that subject matter.

He then determines the training objective of the class, the method of conducting it, determines the facilities and equipment required, and specifies the main training topics. Only then does the lieutenant proceed with preparation of the class proper.

In preparing to hold a technical training class, he carefully studies the requirements of the combat training program, selects and acquaints himself with supplementary literature. All this is done in order to gain a deeper and fuller knowledge of the training topics than is required to present the material in class.<sup>64</sup>

A self-recognized weak link in formal Soviet instruction is the nationality problem. With many soldiers entering service with Russian as their second language, a problem in teaching exists. Special efforts are being made to overcome the difficulty of instructing non-Russians. Major G. Yakimenko related:

Much painstaking work is done with privates who are poorly trained in the technical sense, and especially with those who have a weak mastery of the Russian language. They are given additional help by well-trained officers and sergeants from the very first day.<sup>65</sup>

In explaining the merits of a new instructional methodology, Major General Intse said:

Results of training soldiers of non-Russian nationalities have risen in particular. For a long while we could not explain what was the matter. It turned out that, although being able to read Russian well, they could not always "keep up" with the words of the instructor.<sup>66</sup>

There are many cases where language problems interfere with technical training. Whatever methodologies are used in a unit, language is another burden on the time of NCO's and officers. Extra attention must be given to those who need it. "He had to be worked with a great deal," Senior Lieutenant Romanov said, when telling about how one private became a good specialist. "The soldier had a weak knowledge of Russian and everything did not come easily to him. But regular lessons and the constant help of his commander, Sergeant Ivanov, bore fruit."<sup>67</sup>

The strength of the Soviet technical training program is its variety. Scheduled, formal instruction and practice on-the-job are the basis of the learning effort. Soviet technical training attempts to innovate and gain new ideas while demanding rigorous adherence to regulations and established procedures.

The polytechnization of instruction and the Party-military cooperation in achievement of an ideological position for technology provides the framework for learning. Hard skills are placed on the plane of political obligation and moral duty.

### Learning Through Functional Operations

Driver training is a major effort within the Soviet Armed Forces. Most recruits enter service without driving skills. Some have had DOSAAF driver training and others from collective farms have worked with trucks and tractors. Due to the very small number of private automobiles the average teenager doesn't have a chance to drive his father's car. It becomes the responsibility of the line unit to provide training to meet the needs of its own driving requirements.

Since maintenance training begins with proper equipment operation, driver training is a basic form of teaching maintenance. Teaching a driver-mechanic his job is an example of technical training in the USSR. The importance of it is emphasized throughout Soviet military literature. Major General of Engineer Troops, M. Kushnikov, telling of a field exercise which required the extensive use of engineer equipment in the mountains, said:

The special attention of those present at the exercise was directed to the training of vehicle drivers. Experience has shown that in addition to the vehicle itself, it is also essential to have a good knowledge of the special equipment, to maintain it in a good state of repair and to operate it skillfully.<sup>68</sup>

Soviet military regulations require the organizing of both combat and political training for drivers. Several days a month must be set aside for this.

Primary attention in Soviet driver training is paid to perfecting driving skills and to technical servicing. This includes being able to perform operational adjustments, and detecting, as well as independently eliminating vehicle defects. Initial exercises are conducted in motor parks and the technical service is done in repair stations. From this, students progress to field training where the greatest emphasis lies.

Special training for drivers is also considered to be very important, including rules of vehicle movement and driving in mountains, northern regions, desert and sandy terrain, as well as in large cities. One article pointed out:

Those organizing special training must try to inculcate in the drivers during the training process a careful attitude towards traffic rules, for the maintenance and the constant combat readiness of the vehicles, and for their accident-free driving.

Systematically holding competition on maneuver driving of vehicles, their technical servicing and fuel economy, and on finding and quickly eliminating defects, as well as the wider use of different forms and methods of military-technical propaganda (technical conferences, quizzes, question and answer evenings, and so forth) is recommended to raise the level of special knowledge and to cultivate love for equipment.<sup>69</sup>

In addition to driver training, another functional operation where maintenance training occurs is during motor pool use. Within this framework a great deal of maintenance training is conducted. Most obvious is the pre-release preparation of vehicles. Here soldiers learn by doing. If they don't know enough to get a vehicle out of the motor pool, then they are given on-the-spot instruction to be able to do so. Mechanical inspection procedures, minor repairs and correct paperwork are monitored by motor pool duty personnel. Instruction is given in those areas found to be deficient.<sup>70</sup>

The duties of the motor pool officer emanate from requirements of Article 299 of Internal Service Regulations of the USSR Armed Forces. Duties of the deputy commander for technical matters are covered under Article 287. Various instructional exercises with motor pool duty personnel are found in the requirements of Article 258 of the RSFSR Legal Code. Violations of any of these articles can be punished.<sup>71</sup> By law the motor pool must serve as a training area.

One of the most significant events that provides maintenance training within a unit is motor pool day, required by Article 288 of the Internal Service Regulations. This full day of motor stables requires that not only the vehicles be maintained, but troops be trained and prepared. Major General P. Sushinin related:

The platoon commanders, on the eve of the motor pool service day, hold special classes with the personnel. At those classes they analyze the peculiarities of the tasks, and the sequence of executing them. Also at those classes, personnel study the safety measures and practice firefighting measures. Every driver receives concrete, precise individual assignment plans.<sup>72</sup>

Socialist competition is usually initiated on motor pool maintenance days. Maintenance is performed through the implementation of an entire complex of measures. This can include such measures as starting the day with a ceremonious formal guard mount and a call for fulfillment of all the obligations assumed.

Holding classes the day before and planning each motor pool day in detail avoids premature breakdown of vehicles due to incomplete preventive measures. Instruction the day before also teaches safety. Colonel Klopov stated:

On the eve of motor pool day, usually during self-study hours, instructive studies are held with vehicle drivers and with all subunit personnel during which a study is made of the scope and order of the planned jobs, material support and safety measures.<sup>73</sup>

Informal instruction also takes place during the motor pool day. Some units devote one day a month as a demonstration day to show the troops how maintenance is done correctly. Other units have motor pool demonstration days less often. Engineer Lieutenant Colonel V. Tret'yakov commented: "Practice has made it plain that it is desirable to set aside one motor pool service day at the beginning of each training period."<sup>74</sup>

Three other functional operations which are strong vehicles for learning are seasonal maintenance requirements, preparation for equipment storage, and unit equipment transfers. In most units three to four days are devoted to training prior to seasonal change-over of equipment. Socialist competition is organized at this time to expedite the process.<sup>75</sup> Winterizing or de-winterizing an end-item can be a complicated task. In a two-year tour of service the soldier will

not undergo enough seasonal change-overs to become very experienced at it. Colonel-General of Technical Troops, A. Smirov said:

The successful accomplishment of all work provided for, of course, is determined by how clearly their organization is thought through and planned and how well the personnel who service, repair, and operate the vehicles are instructed and trained. This is why the conversion of equipment to autumn-winter operation must be preceded by training assemblies of the officers. The leaders of such assemblies should concentrate main attention on the organization of demonstrations and practical lessons. For the activity of the officers is not reduced to general direction alone. They are to train their subordinates and check their activity. And, firm practical skills are required in addition to profound knowledge.<sup>76</sup>

Preparing equipment for seasonal change involves the use of lesson plans, demonstrations, mock-ups and other training aids. The Party organs are involved and various methodologies reappear as with other technical instruction. Although the main emphasis in seasonal maintenance training is on the practical, Major General-Engineer P. Sushinin made the point that:

Considerable benefit can also be derived from theoretical exercises during which the students learn how the vehicles perform during low temperatures and also other peculiarities of their operation during winter months. During such exercises, emphasis should be placed on explaining the effects that low temperatures can have on the physical-chemical properties of fuel, on the storage batteries and also on the mechanical properties of metal and rubber items.<sup>77</sup>

While Sushinin also explained theory and the need for it, Major General of Technical Troops, V. Petrov, stated:

No less than 75% of the training time should be given to practical exercises. It is very important for them to be conducted in an animated, interesting manner, in order to increase their effectiveness. For example, it is desirable, during classes at the work sites, to make the groups smaller (to divide the basic group into three or four subgroups). This will make it possible not only to save time, but also to make the best use of educational materials. Sufficient attention should be given to classes to popularize the experience gained by the advanced drivers and repairmen.<sup>78</sup>

Preparation for equipment storage is another functional operation in which technical training takes a prominent role. The Soviet Army keeps much of its unit equipment in storage. Units remove it only when it is needed for a large field exercise or other operation. Most of the training areas have equipment which is signed over to the units as they rotate through for their periodic qualifications, drills and firings. Only a minimum of items are kept ready in most units. The purpose of this type of storage is to save wear and tear, engine hours, fuel and in general extend the life of the equipment.

According to Colonel-Engineer A. Svenchikov:

The storage system is important among the measures designed to keep armored equipment operational and constantly ready for combat. It insures the technical serviceability of the assemblies, systems, mechanisms and parts of combat vehicles for prolonged periods.

Tanks, infantry combat vehicles and armored personnel carriers are usually placed in storage immediately upon the completion of tactical training. Every tanker knows that the future operational reliability of equipment depends on how well it is prepared for storage. The men's development of skills in the technical servicing of their vehicles and in preventive maintenance is also important.<sup>79</sup>

Teaching personnel the basic methods of sealing and mothballing equipment requires them to know its nomenclature, construction, and operational procedures. Both theoretical and practical questions must be answered in the minds of the troops before they can be expected to perform properly.

Training troops to prepare their equipment for storage requires not only a knowledge of the equipment to be stored but also the equipment and techniques to do the preservation. Sealing, lubricating, preparing hoods, placing silica gel, determining residual moisture, touch-up painting, and cleaning corrosion are all tasks which must be taught before the process can begin. In the words of a Soviet technical officer: "Experience shows that in those subunits where the personnel underwent preparatory training on the placing of machines and equipment in storage, work is faster and better."<sup>80</sup>

The rotation of units through training centers is yet another area of functional operation that provides a framework for maintenance training. The facilities at a training center usually include firing ranges, tank driving ranges, tactical training fields as well as chemical and engineer areas. Colonel N. Karabut emphasized:

Moreover, conditions which are more advantageous for the technical maintenance of tanks, armored personnel carriers, and infantry combat vehicles of the combat training group, are created because the battalion when it has finished its session at the training center must transfer all the equipment to another battalion in working condition, well maintained and ready for the training session.<sup>81</sup>

The acceptance of equipment from a departing unit and then having to turn that same hardware over to others as soon as the training session is completed places heavy maintenance demands on any unit in that type of cycle.

#### Officers as Teachers and Doers

With a minuscule number of career NCO's in the Soviet Army and an almost total turnover in the enlisted ranks every two years, the only real institutional experience rests in the officer corps. The praporshchik or chief warrant officer is the primary route of advancement for those soldiers who want to remain in service beyond their initial obligation. It is up to the officers and praporshchiks

to teach as well as be able to do every job in the army.

The significant service school effect within the USSR is officer training and education. Whereas the soldier gets almost no formal schooling outside his unit, the army officer is given many opportunities in his career pattern to both attend school on a full-time basis and take part-time as well as correspondence courses. In discussing the need for deeper military technical knowledge on the part of officers, Colonel-Engineer A. Kiryushin said that conditions in line units are such that maintenance and upkeep of equipment must be accomplished despite the fact that "continuous development and improvement of equipment and weapons and the constant change in methods of their combat employment require the personnel of units to increase their level of technical training steadfastly."<sup>82</sup>

Because of the pressing requirements for technological expertise and the demands of time which curtail extended training schools for draftees, the relationship between the development of tactics and equipment places demands on the Soviet officer:

This relationship places a complex and important mission before military educational institutions: to give future commanders all necessary skills while still within the walls of the school so that on assuming command of a subunit they can not only perform the necessary adjustments and detect and eliminate malfunctions quickly, but also train their subordinates in all this.<sup>83</sup>

Officers must know "nuts and bolts" as well as management and leadership skills.

Methodologies used to teach officers and cadets are the same types used in the line units. In fact, the whole spectrum of training methodologies used in line units finds its origin in the various officer and cadet schools. The new officers are sent to the field with practical experience gained doing hands-on chores in their officer candidate schools. Cadets function in various roles learning enlisted tasks. The officer then knows what his subordinates should know and can teach the draftees by showing them how to do it. An example of this is given by Major General of Tank Troops, M. Kolesnikov:

The motor pool plays an important role in organizing cadet technical training. Every element, section, and post within the pool is utilized as a training place. Here the cadets acquire the necessary skills of servicing the equipment and determining the technical condition of vehicles, and they master the responsibilities of the chief of a technical control point, subunit officers, and crewmembers.<sup>84</sup>

Officer training in the technical and maintenance areas is not limited to established schools and recurring courses. Special training is set up as needed. Introduction of new equipment requires the officers to learn first so that they then can teach the soldiers how to operate and maintain the new end items. A recent case is the introduction of self-propelled artillery. The officers of the various units receiving the new guns had no previous experience with them. Lieutenant General of Artillery, V. Lebedev wrote:

It should be noted that the technical design complexity of self-propelled and towed guns cannot be compared, but

the number of hours available for technical training in both types of subunits differs little. That is why Officer Kotor's subunit sets aside supplementary time for officer technical training through purposeful organization of their independent work during servicing days. In the latter instance two missions are accomplished simultaneously: first is the servicing of a particular assembly; and the second is the process of careful study of its design, adjustments and maintenance procedures.<sup>35</sup>

The officer with technical responsibilities is the one who must not only organize the complicated process of maintaining equipment in constant combat readiness, he must also control the process by distributing assignments among junior officers and soldiers, giving them specific tasks, issuing on the spot instructions when problems arise, and then checking the quality of the finished work. These are tasks which senior NCO's in Western armies perform. In a conscript army without career NCO's, the officers are transformed from leaders to doers. When time is short and soldier skills are not up to the tasks at hand the officer must personally make needed adjustments and repairs.

Lieutenant General-Engineer I. Balabay implied that no one in a unit is technically trained except the officers:

The closest assistants to the officers are the praporshchiks and sergeants, categories of command and technical cadres that are closest to the soldiers. There is a substantial dependence on these latter for discipline among the men, for the condition of equipment, and for combat readiness of subunits. This is why the officer-engineer should try to train first the praporshchiks and sergeants, because these latter include the commanders of maintenance and repair subunits, vehicle driving instructors, chiefs of technical control points, and other specialists. Their training should be as purposeful as possible, and should be directed at mastering a specialty, at gaining the ability to carry out their functional duties in a practical way.<sup>36</sup>

Maintenance training in the Soviet Army is in the last analysis, officer training. It is the officers who receive the formal schools and the extended periods of instruction in scientific theory and practical application. It is the officers who remain in service long enough to gain the necessary experience to be able to perform those tasks which only experience teaches. It is the officers who must teach the soldiers, and officers can only teach as much as they know. Therefore, a heavy scientific and engineering emphasis in officer preparatory programs finds its utilization in the line unit when, with troops in the field, it is left to the officer to insure that repairs are made, maintenance is performed and equipment works.

## CONCLUSIONS

The Soviet Army is composed primarily of conscripts. The number of career enlisted men is insignificant. Army experience and institutional memory lies in the officer corps and within a warrant officer type rank known as the praporshchik. Only minimum training is provided the draftee before he reports to his duty unit. The major burden of training rests in the unit in which he serves his obligation.

The problem of troop turnover, compounded by the ever-increasing complexity of modern weapons and materiel, creates a training problem which the Soviets are attempting to solve in their own unique way. Communist ideology serves as the basis for training methodology. The Soviet solution is an integration of political training with technical and scientific subjects.

The Communist Party plays an important role in military affairs and the achievement of combat readiness. Materiel is given an ideological position in the society and the maintenance of it becomes both a moral and political obligation. Socialist competition and pledges are used to spur soldiers on to meeting pre-established norms of performance. The Party is heavily involved in training and attempts to motivate through ideological rhetoric.

The uniqueness of Soviet maintenance training is further pointed out by the totality of effort devoted to the problem and the broad nature of the solution. In other words, the whole nation is mobilized towards technological advancement. All national means are targeted towards achieving scientific and technological progress. Maintenance training receives its strength from being an important part of a greater whole. Military efforts in the technological realm supplement those of the civilian sector. Draftee maintenance skills learned on active duty are viewed in terms of being national assets, usable after service when working in the factory or collective farm.

The very effort which the Party and national government exert towards the achievement of higher technical and maintenance training is an indicator that problems exist. The frequency of appearance of military journal articles on the subject as well as the preaching nature of those articles give the impression that much is still left to be done. Shortages of technical expertise in the civil sector as well as low levels of education are reflected in the type training programs established for draftees. Language problems exist and hurt training.

National priorities in the USSR have created conditions in which there is a shortage of technical expertise and a high requirement within the military for such skills. Solutions such as better and more universal civilian schooling, improved basic training, increased and extended specialist courses at central training centers, and the creation of conditions for enlisted specialist career opportunity with improved life styles do not appear as alternatives the Soviets are willing to accept. Locked in their desire for massive numbers of men, drafted, trained quickly and cheaply, to then be placed in reserve pools, the Soviets continue to face training problems which they have created for themselves.

By turning to Marxist-Leninist ideology and putting the burden of technical training on the tactical line unit, the Soviet system provides a workable solution within self-imposed constraints. Officers must devote a great part of their efforts not only to teaching but to performing simple functions that conscript enlisted men never learn to do. This drain on officer time and energy detracts from the overall effectiveness of the Army. The use of the praporshchik can be

considered a substitution for the career NCO but the lack of quantity is a problem. There just are not as many praporshchiks as there would be senior non-commissioned officers. Human resources can be spread only so thin and the Soviet Army, effective as it may be, is already stretching its technical expertise to the maximum.

# END NOTES

Translation comments: Quotations used from Tekhnika i Vooruzheniye, Vestnik Protivovozhushnov Oborony and Tyl i Snabzheniye Sovetskikh Vooruzhennykh Sil are taken from the Foreign Service and Technology Center (FSTC) translation series available through the Defense Documentation Center (DDC). Quotations taken from Voyennyy Vestnik use the Assistant Chief of Staff for Intelligence (ACSI) U.S. Army translation series. Minor corrections have been made where felt necessary. The U.S. Air Force Series of books on Soviet military thought have been used for quoted English translations as applicable.

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